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XIX.—*On an apparently new Form of* Holothuria.

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[Plate XI.]

In the autumn of 1859 I dredged, from 5 fathoms of water in Bressay Sound, Shetland, the *Holothuria* which forms the subject of this memoir (Pl. XI. fig. 1). It was clinging to the inside of a dead and half-open *Modiola vulgaris*. When captured, it was of a cream-colour slightly speckled with brown; but since it has been in confinement, it has sensibly deepened in colour. During the first months of its imprisonment it was very lively, especially at night; during the day, when exposed to the light, it always contracted itself into a little ball, confining itself to one spot, and that the one exposed to sun-light. The tentacles were always exposed at night, but were immediately retracted whenever any attempt was made to examine them. About the beginning of the second month of its confinement it became more sluggish, and remained for days contracted, never displaying its tentacles even at night. The body contracted so firmly upon itself, that many of the feet by which it was attached gave way, and were left sticking to the sides of the glass vessel in which it was confined. After remaining in this condition for some time, the integument about the centre of the body at last ruptured, and through the opening a portion of the viscera were protruded, which ultimately sloughed away; at the same time a considerable portion of the external skin desquamated, the animal not appearing to suffer much from the process, for the opening healed shortly afterwards. The animal has been kept

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in a small shallow vessel of sea-water, with only a little piece of sea-weed in it to keep the water in good condition. During by far the greater part of the nineteen months of its confinement it remained contracted, seldom moving from one spot. The only food it could possibly have obtained must have consisted either of microscopic animalcules or the spores of Algæ. The animal is still alive; and I am therefore not in a position to say anything regarding its internal structure.

The dorsal region of the body, when the creature is contracted, is of a deep purplish-brown tint, but the ventral surface is of a paler hue. The dorsal surface, when the creature is distended, approaches very much to the colour of the ventral aspect when in a state of contraction.

When contracted, it is little more than a quarter of an inch in length, and about the fifth of an inch in breadth; but when distended and moving about, it becomes double this length, and its breadth also is slightly increased.

The five double rows of sucking-feet are unsymmetrical, the two dorsal rows being irregular in their distribution. The dorsal feet are much less numerous than the ventral, which they greatly exceed in size, and from which they differ very much in their undilated tips, and by their being seated in some instances upon rounded eminences or tubercles of considerable size. These feet are capable of complete retraction into the tubercles. Though the two dorsal rows of feet differ very much from the ordinary arrangement of these organs in the Holothuriadæ, we can nevertheless trace faint indications of the double character of the rows.

The three double rows of ventral sucking-feet are fully developed; the feet are placed opposite to one another, and are dilated at their tips, but are only partially retractile. The animal walks upon the three well-developed rows; and if turned upon the aborted ones, it immediately recovers itself, and turns round to what appears to be its ventral surface. In the anomalous genus *Psolus*, as is well known, the locomotive organs are restricted to a small flattened ventral disk, on which the three developed rows of feet are disposed.

The arrangement of the feet in the animal under consideration is another instance of a like specialization of function, and indicates the tripod nature of the *Holothuriæ*. Viewed thus, this little animal is fraught with interest, and may serve to connect, by its gradation of form, the genus *Holothuria*, with its five well-developed rows of locomotive feet, and the genus *Psolus*.

The tentacles (Pl. XI. fig. 2) are ten in number; eight of them

are long, pedunculated, and alternately branched; and the other two are short and divided at their tips. They are all of a pale-yellow colour, very pellucid, and are about a fifth of the length of the body when it is fully extended. The two short tentacles correspond to the two tuberculated rows of feet of the dorsal aspect.

The body of the animal is covered with calcareous plates of an irregular form, perforated by nearly circular apertures (fig. 4). The plates found in the feet of the three ventral rows (fig. 7) are spindle-shaped; but they change their form in the feet immediately surrounding the head (fig. 8), and become in appearance very similar to the plates found on the body-skin. The plates of the dorsal tubercles and feet (fig. 3) resemble in their irregularity the plates of the body of the animal; and the same may be said of the plates occurring in the tentacles (fig. 6), in which they may be found extending to their ultimate divisions.

The very delicate structure of the feet enabled me to examine them microscopically in the living animal; and when so examined, a continuous circulation of a minutely granular fluid may be seen, the current consisting of two streams—one passing along one side of the foot to the sucking-disk, and the other flowing back from this structure to the body of the animal.

This little creature evidently belongs to Linnæus's genus *Holothuria*, which Van der Hoeven has lately revived with the following signification:—

"Feet of twofold structure and figure, some cylindrical, dilated at the tip, usually occurring in the abdomen only, others situated on the back, not dilated at the tip, emerging from warts on the back. Body cylindrical or flattened in the abdomen."

Having only found one specimen of this *Holothuria*, it would be premature, it appears to me, to describe it as a new species.

EXPLANATION OF PLATE XI.

Fig. 1. *Holothuria*, three times the natural size.
Fig. 2. Buccal extremity and tentacles.
Fig. 3. Calcareous plates of dorsal feet.
Fig. 4. „ „ body-skin.
Fig. 5. „ „ dorsal feet near head.
Fig. 6. „ „ oral tentacles.
Fig. 7. Portion of ventral foot, showing the form and arrangement of the plates.
Fig. 8. Calcareous plates from feet surrounding the head.